

XXI. *On some new species of African Pierinæ in the collection of the British Museum, with notes on seasonal forms of Belenois.* By ARTHUR G. BUTLER, Ph.D., F.L.S., &c.

[Read November 16th, 1898.]

WHILST arranging the Pierinæ of the genus *Phrissura*, I discovered three males of a species which is certainly undescribed, mixed up with the series of *P. sylvia* (the dry-season form of *P. cudoxia*), and in the Hewitson collection I discovered the female of the same species I now describe.

*Phrissura perlucens*, sp. n.

♂. Above nearly resembling *P. sylvia*, but with the inner edging of the black outer border of primaries more blurred, less distinctly dentate-sinuate, the basal patch of lemon yellow without the least tinge of orange; on the undersurface the border far more distinct than in *P. sylvia*, irrorated with dark brown, yellowish externally; the base bright lemon yellow as above (not orange, as in *P. sylvia*); the secondaries also with the costal area at base bright lemon yellow instead of orange. Expanse, 50—61 millim.

♀. Similar in pattern to the female of *P. sylvia*, but with the ground-colouring of all the wings above pure white; the border of primaries and marginal spots of secondaries rather broader than in *P. sylvia*; primaries below bright lemon yellow at base, slightly washed with saffron on costa; apical area irrorated with grey-brownish and with an oblique subapical stripe of the same colour; secondaries with the base of costal area golden yellow, slightly more saffron on costal margin: no trace of the ochreous bordering common to the undersurface of all the wings in *P. sylvia*. Expanse, 64 millim.

*Hab.* ANGOLA and GOLD COAST (*Mus. Brit.*).

*Phrissura narcissus*, sp. n.

♀. Primaries bright ochreous; a grey subapical crescentic band; veins pale buff, partly dividing a marginal series of black spots;

secondaries bright lemon yellow with a marginal series of cordiform dark brown spots terminating the nervures; primaries below ochreous with pale creamy costa, the cell suffused with saffron towards the base, but not abruptly; subapical grey band obsolete, marginal black spots smaller than above, fringe black; secondaries butter yellow with deep saffron basi-costal area; spots on margin as above; pectus creamy yellow; abdomen flesh-tinted. Expanse, 59 millim.

*Hab.* ANGOLA (*Coll. Hewitson*).

This is so strikingly distinct from everything else in the genus that I do not hesitate to name it in spite of the fact that it is a female; the male will probably be found to have a broad blackish border to the primaries. In the genus *Belenois*, of which I have recently completed the arrangement, the seasonal forms are always tolerably well-defined. *Belenois*, though nearly related to *Phrissura*, has a different style of marking; the males never have a pencil of hair between the anal clasps as have those of *Phrissura*; the primaries as a rule are more produced, the costa being longer, so that the wing-outline more nearly resembles that of *Appias*; there are however exceptions to this rule in a few specimens which more nearly approach *Phrissura* in outline. A few notes on some of the seasonal forms in *Belenois* may perhaps be useful to the systematist; they follow the usual rules of variation which have, in many cases, been more or less satisfactorily proved by collectors and breeders of *Pierinæ*; so that there can be no reason for refusing to accept them as facts. If they are rejected as seasonal forms, they must be accepted as variations, inasmuch as (in nearly every case) the intermediate phase occurs.

*Belenois hedyale*, Cramer.

This is a wet-season phase, of which *B. rhena* is the female of the dry phase. In the Museum there are six males and one female of the wet phase in addition to five examples in the Hewitson collection; of a perfectly intermediate phase we have five males; of the dry phase we have three males and two females, one additional example being in the Hewitson collection.

*Belenois thysa*, Hopff.

The Angolan form of this species differs somewhat from the more Southern and the Eastern type of the species,

representing a slight local variation of which *B. melidolæ* is the dry phase. The typical figures of the species represent the intermediate phase, the wet phase of which has heavier black borders with which the subapical spots on the primaries are often united; the dry phase is represented by *B. sabrata*. A singular form of the species occurs sporadically in the area bounded by the Victoria Nyanza and Lake Nyasa; the females of this form differ so remarkably in outline and in the more or less lilacine greyish suffusion of the under surface that one might be excused for believing that they represented a distinct species.

*Belenois dentigera*, Butl.

This species, which is related to *B. calypso*, was based upon a dry-season male collected by Emin Pasha. The intermediate phase is represented by *B. welwitschi* of Rogenhofer (who states that it was collected in Angola!); of this phase we have a male obtained by Emin Pasha at Kangasi and three males from Nyasa-land. Of the wet phase, a heavily marked and more brilliantly coloured edition of the intermediate phase, we possess four males and one female from Nyasa-land.

*Belenois instabilis*, Butl.

Of this species we possess both sexes of all the phases, the wet form of the female somewhat resembling that sex of *B. ereona* on the upper surface; both sexes are very heavily black-veined on the under surface. The intermediate phase bears much resemblance on the under surface to the wet phase of *B. dentigera*, excepting that the insect is considerably smaller, the apical markings on the primaries are sulphur yellow and the median vein of the secondaries, with its branches, is black. In the dry form the black markings are reduced on both surfaces, and the secondaries below are more ochraceous.

*Belenois subeida*, Felder.

Related to the preceding; we possess only single males of the wet and intermediate phases and a female of the dry phase. The species doubtless replaces *B. instabilis* in North Africa: whilst it is much more heavily bordered on

the upper surface, it is altogether less brilliantly coloured below.

*Belenois crawshayi*, Butl.

We now possess wet, intermediate, and dry phases of both sexes of this species; *B. diminuta* was based upon the female of the dry phase.

In the collection made by Dr. Gregory in British East Africa is a species related to the preceding which I confounded with the Eastern form of *B. zochalia*: a careful study of the two has now convinced me that this was an error, the form of the wings being constantly very different, and the costal margin of the primaries and the abdominal margin of the secondaries being noticeably shorter.

*Belenois formosa*, sp. n.

♂ *Belenois zochalia* (part), Butler, P.Z.S., 1894, p. 579, pl. xxxvii, fig. 3.

♀. Primaries white above, the basal area nacreous; secondaries white or pale sulphur yellow; markings as in *B. zochalia*.

At first I was inclined to regard this as the dry phase of the East-African representative of *B. zochalia*, but the coloration and vivid marking of the male are so distinctly characteristic of a wet-season phase, that I was compelled to abandon this idea as soon as it occurred to me. Undoubtedly the pattern of the females of both forms is very similar, but nevertheless I feel sure that two species exist; we have five males and three females of *B. formosa*.

Of typical *B. zochalia* from South Africa we have wet, intermediate, and dry forms of both sexes; they differ chiefly in the definition of the black markings on the under surface.

*Belenois severina*, Cramer.

Of *B. severina* we have an immense series commencing with the wet-season *B. infida* (P.Z.S., 1894, pl. xxxvii, figs. 1, 2), passing through two fairly defined intergrades, of which one is typical *B. severina*, to the extreme dry form, which nearly resembles *B. creona* on the under surface. *B. boguensis* of Felder is a Northern race of the species showing less variation, the wet phase being not much unlike the first intermediate phase of *B. severina*, but the dry phase more nearly approaches *B. creona*.

*Belenois leucogyne*, Butl.

This interesting species seems to possess a dry phase only.

*Belenois creona*, Cramer.

The wet form of this species seems to be extremely rare; we possess only one pair; above it resembles the common intermediate phase, but on the under surface the veins are lilacine grey in the male and black in the female. The best characters for distinguishing *B. creona* from *B. severina* consist in the smallness of the subapical spots on the upper surface of the primaries in the males, the black and scarcely spotted border of the secondaries in this sex and the white ground-colour of the female streaked on the under surface with deep ochreous. *B. creona* is essentially a West-African species; *B. severina* Southern and Eastern.

*Belenois johannæ*, Butl.

I know this only as a dry-season phase; it is a very distinct species.

*Belenois mesentina*, Cramer.

We have a very extensive series of this species, *B. augusta* = *agrippina* = *lordaca* being the wet phase, *B. mesentina* = *syrinæ* intermediate, *B. aurigena* dry, and *B. taprobana* being an insular dry phase differing in the blacker outer border to the male primaries, on which the subapical spots are less prominent.

*Belenois teutonia*, Fabr.

The wet form is *B. clytie* = *niseia*; the intermediate form shows a narrow break between the discocellular bar and outer border in both the primaries and secondaries of the female, but no noticeable difference in the male; in the dry form the discocellular bar is well separated from the border, and the white spotting of the border in both sexes is clearly defined.

*Belenois peristhene*, Boisd.

The wet form has the secondaries below black with a submarginal row of orange spots. We have two examples

from New Caledonia in which the whole basal area of the primaries below is also orange, as in *B. java*; these are probably either reversional sports or the result of hybridism between the two species. The intermediate form differs in having several squamose subbasal orange patches on the under surface of the secondaries; the dry form has the cell and a series of patches below it white, the basicoastal patch and submarginal spots remaining orange.

*Belenois elarissa*, Butl.

The seasonal differences in this species much resemble those of *B. peristhene*, the orange spots of the under surface being replaced by sulphur yellow; we have all the phases in both sexes.

Of *B. picata* we possess only a dry-season phase.

*Belenois java*, Sparrm.

*B. deiopeia*, Don., is the dry phase. We possess an intermediate form from the New Hebrides; as the species occurs as far to the East as the Friendly Group, it certainly crosses the range of *B. peristhene*, and is quite likely to hybridize with it.

*Belenois raffrayi*, Oberth.

This is a wet-season form, and, without examining specimens of the allied *B. margaritacca*, I would not suggest that there may be more than affinity between them. It is quite possible that they may be perfectly distinct.

Respecting *B. gidica*, much confusion has arisen; I may begin by stating emphatically that *B. gidica* is not the wet-season form of *B. abyssinica*, and that *B. allica* of Oberthür is not the *B. allica* of Boisduval, but is identical with *B. abyssinica*. Furthermore, there are two South-African species of the group, easily separated by any one who has an eye for form and pattern.

*Belenois gidica*, Godt.

Differs at a glance from *B. gidica* of authors in the lack of continuity between the discocellular black spot of primaries with the costal borders, the distinctly narrower and blacker outer borders of the primaries, the fourth white spot on which opens without break into the ground-colour, so as to form a quadrate excision of the

border. On the under surface the differences are much greater; the apical brown border is unbroken, with three small whitish spots internally as above, whitish veins, and five tear-like whitish submarginal dots between the veins. Secondaries with irregular brown borders interrupted by diffused whitish spots internally and enclosing six distinct submarginal white spots; veins pale; an oblique abbreviated brown spot at the end of the cell, but no other markings. Expanse, 57 millim.

*Hab.* CAPE OF GOOD HOPE.

Two males of the wet-season phase of this very distinct species were in the Godman and Salvin collection associated with *B. gidica* of Trimen and others. To the latter I propose to restore the name of *B. westwoodi*, Wallgr.

*Belenois abyssinica*, Lucas.

The Godman and Salvin collection contained two males, and the Museum series a female of the wet-season phase of this species. It differs from the wet phase of *B. westwoodi* above in the almost confluent character of the marginal spots on the male secondaries; the differences below are considerable, the ground-colour being much yellower, and all the dark brown markings on the basal area of the secondaries being wholly erased, bringing it decidedly nearer to *B. gidica*.

The differences between the dry-season forms of the two species do not appear to be so marked, though they are of the same nature, the rusty ground-colour not being so well suited for emphasizing the absence of dark markings as the primrose yellow of the wet-season phase.

*Belenois westwoodi*, Wallgr.

We have a long series of this species, the female of which is very variable. I suspect that the most typical wet phase is represented by the more heavily bordered and distinctly marked examples, but the change from heavy to light borders is so gradual that I have not attempted to distinguish an intermediate phase. One of our female examples in which the upper surface is very lightly marked shows a distinct approach to the dry form in the coloration of the under surface. Of the dry phase we have five examples from Eastern Africa as far southward as Natal, and there is an equal number in the Hewitson collection.

*Belenois occidentis*, sp. n.

Allied to *B. westwoodi*, but distinctly larger, the apical area of the primaries irrorated with grey, the outer border greyer than in *B. westwoodi*, the irregular transverse subapical band interrupted in the middle; the veins blackened to the cell, excepting the first two median branches; the discocellular black bars continued round the end of the cell as far as or beyond the emission of the second median branch; secondaries with a well-defined black discocellular dash and several black traces of the discal markings of the under surface; black marginal spots and fringe as usual. On the under surface nearly the whole of the veins are brown, darker on the primaries; in the wet phase the primaries show a grey basal patch terminating in a black discoidal streak; the black discocellular bar is continued broadly to the first median branch along which it runs to the middle, so that it forms a large Z-shaped character; in the dry phase the discocellular bar runs backward only half way to the origin of the first median branch. In the character of the secondaries this species is like *B. westwoodi* on the under surface. Expanse, 64 millim.

*Hab.* CONGO; LOANDA (*Mus. Brit.*).

These examples were received from the Godman and Salvin collection, a male (wet phase) from the Congo, and a pair (dry phase) from Loanda. There is very little doubt that this is the species for which Boisduval proposed his manuscript name of "*Pieris allica*," but M. Oberthür having published the name as applying to *B. abyssinica*, it has become a synonym and cannot now be resuscitated.